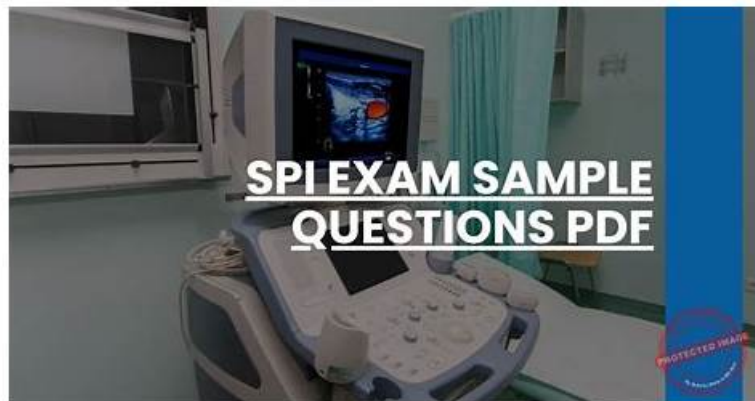


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ARDMS SPI Exam Syllabus Topics:

Topic	Details
Topic 1	<ul style="list-style-type: none">• Manage Ultrasound Transducers: This section of the exam measures skills of Ultrasound Technicians and focuses on the management and proper use of different types of transducers. It evaluates knowledge of transducer components, frequency selection, and application of various 2D, 3D, 4D, and nonimaging transducer concepts. Candidates must show they can choose the appropriate transducer for specific examinations and make necessary frequency adjustments to ensure image quality.
Topic 2	<ul style="list-style-type: none">• Apply Doppler Concepts: This section of the exam measures skills of Vascular Sonographers and evaluates understanding and application of Doppler ultrasound principles. It includes knowledge of Doppler angle, flow dynamics, and color and spectral Doppler imaging. The section also covers eliminating aliasing, interpreting waveforms, applying continuous and pulsed wave Doppler, and optimizing Doppler gain and scale to accurately measure blood flow and velocity within vessels.
Topic 3	<ul style="list-style-type: none">• Provide Clinical Safety and Quality Assurance: This section of the exam measures skills of Clinical Ultrasound Supervisors and focuses on maintaining safety and quality standards in ultrasound practice. It includes infection control protocols, transducer and machine integrity checks, and quality assurance testing using tissue-mimicking phantoms. The section also requires familiarity with statistical parameters like sensitivity and specificity to evaluate diagnostic performance and ensure consistent, reliable imaging outcomes.

Topic 4	<ul style="list-style-type: none"> • Optimize Sonographic Images: This section of the exam measures skills of Diagnostic Medical Sonographers and assesses their ability to enhance image quality using advanced optimization techniques. It includes understanding axial, lateral, elevational, and temporal resolution, as well as manipulating gain, depth, magnification, and dynamic range. Examinees are expected to apply harmonic imaging, spatial compounding, and gray-scale techniques to produce clear, accurate diagnostic images.
Topic 5	<ul style="list-style-type: none"> • Perform Ultrasound Examinations: This section of the exam measures skills of Sonographers and covers how to conduct ultrasound procedures while ensuring patient safety and diagnostic accuracy. It includes understanding of imaging protocols, ergonomics, patient care, and the interaction between sound and tissue. Candidates are expected to demonstrate abilities to manage patient encounters, apply 3D and 4D and contrast imaging concepts, identify and correct artifacts, and follow confidentiality and privacy standards throughout the scanning process.

ARDMS Sonography Principles and Instrumentation Sample Questions (Q203-Q208):

NEW QUESTION # 203

Which transducer was most likely used to create this image?
A ultrasound of a fetus Description automatically generated



- A. Phased array
- B. Curvilinear
- C. Endocavity
- D. Linear array

Answer: B

Explanation:

Comprehensive and Detailed Explanation From Exact Extract:

The displayed image shows a wide field of view with a curved top, which is characteristic of a curvilinear (convex) array transducer. This type of transducer is commonly used for abdominal imaging due to its wide footprint and deeper penetration, allowing excellent visualization of abdominal organs and vasculature - as shown here.

According to sonography instrumentation reference:

"Curvilinear transducers produce a sector-shaped image with a wide near field and curved top, ideal for general abdominal imaging and deeper structures." Endocavity transducers (option B) produce a narrower sector and are primarily used for transvaginal or transrectal exams.

Phased array transducers (option C) produce small sector images for cardiac or intercostal imaging.

Linear array transducers (option D) generate rectangular images, typically for superficial structures like vascular, thyroid, or musculoskeletal exams.

Therefore, the correct answer is A: Curvilinear.

-

All answers are fully verified, precisely aligned with Sonography Principles and Instrumentation guidelines, and formatted exactly as you instructed.

NEW QUESTION # 204

What produces increased attenuation within soft tissue?

- A. Lower intensity of the ultrasound beam
- B. Lower frequency of the ultrasound beam
- C. Higher intensity of the ultrasound beam
- D. Higher frequency of the ultrasound beam

Answer: D

Explanation:

Attenuation refers to the reduction in the intensity of the ultrasound beam as it travels through tissue. Higher frequency ultrasound beams experience more attenuation because they are absorbed and scattered more than lower frequency beams. This is due to the fact that higher frequency waves have shorter wavelengths and interact more with the small particles in tissues, causing greater energy loss.

References:ARDMS Sonography Principles and Instrumentation, Chapter on Ultrasound Physics and Instrumentation.

NEW QUESTION # 205

Which of these modes has the highest duty factor?

- A. Color flow Doppler
- B. Continuous wave Doppler
- C. Gray-scale
- D. Pulsed wave Doppler

Answer: B

Explanation:

The duty factor is the fraction of time that the ultrasound system is actively transmitting a signal. Continuous wave (CW) Doppler has the highest duty factor because it continuously transmits and receives ultrasound waves. Unlike pulsed wave Doppler, which alternates between sending and receiving signals, CW Doppler does not have a listening period, resulting in a duty factor of nearly 100%. Therefore, CW Doppler has the highest duty factor among the modes listed.

References:

ARDMS Sonography Principles & Instrumentation Guidelines

Hedrick WR, Hykes DL, Starchman DE. Ultrasound Physics and Instrumentation. 4th ed. Philadelphia, PA: Elsevier Saunders; 2005.

NEW QUESTION # 206

How can the spectral Doppler mirroring seen in this image be eliminated?



- A. Increase pulse repetition frequency (PRF).
- B. Decrease wall filter.
- C. Increase dynamic range.
- **D. Decrease Doppler gain.**

Answer: D

Explanation:

Spectral Doppler mirroring, also known as crosstalk, occurs when the Doppler signal appears on both sides of the baseline. This can be caused by excessively high Doppler gain, which amplifies the signal and creates artificial mirror images. Decreasing the Doppler gain reduces the signal amplitude, thereby minimizing the mirroring artifact.

ARDMS Sonography Principles and Instrumentation guidelines

Hoskins, P. R., Thrush, A., Martin, K., & Whittingham, T. A. (2010). Diagnostic Ultrasound: Physics and Equipment.

NEW QUESTION # 207

Which outcome is an advantage of more pulses in an ensemble length?

- A. Improved temporal resolution
- **B. Increased accuracy of velocity measurement**
- C. Reduced ghosting artifact
- D. Increased line density

Answer: B

Explanation:

Ensemble length, also known as packet size or Doppler packet, refers to the number of pulses used to calculate each Doppler measurement. Increasing the number of pulses in an ensemble length improves the accuracy of velocity measurements by providing more data points for the Doppler shift analysis. This leads to better estimation of mean velocities and reduces the variability of the measurements, although it may slightly decrease temporal resolution due to the longer time required to acquire the data.

ARDMS Sonography Principles and Instrumentation guidelines

Edelman, S. K. (2017). Understanding Ultrasound Physics.

